



FINAL FORMER MARINE CORPS AIR STATION (MCAS) TUSTIN Base Realignment and Closure (BRAC) Cleanup Team (BCT) Meeting Summary 12 October 2017



Meeting Location: Amec Foster Wheeler, Irvine, California

Meeting Date/Time: 12 October 2017/3:00 PM to 5:20 PM

Meeting Summary Prepared by: Katy Robinson, Accord MACTEC 8A JV (AM8AJV)

Meeting Attendees:

Navy:

Jim Sullivan (Base Environmental Coordinator [BEC])

*Guy Chammas (Acting Lead Remedial Project Manager [RPM])

Rich Pribyl (Project Manager [PM])

Alex Bollweg (PM)

Agencies:

Patricia Hannon, Regional Water Quality Control Board, Santa Ana Region (RWQCB)
Christine Bucklin, Department of Toxic Substances Control (DTSC)

*Mary Aycock (United States Environmental Protection Agency [U.S. EPA])

Others:

Matt West, City of Tustin (City)

Ken Piguee, City

Tony Guiang, AM8AJV

Katy Robinson, AM8AJV

Derrick Coleman, Tetra Tech

*Attended via teleconference

Attachments:

1. Per- and Polyfluoroalkyl Substances (PFAS) Sampling in Groundwater at Operable Unit 3, Installation Restoration Program Site 1
2. Carve-Outs (COs) 5 and 6 Vapor Intrusion Assessment Update, Former Marine Corps Air Station Tustin
3. Former MCAS Tustin, California. BCT Update. October 12, 2017. Operable Unit (OU)-1A and -1B Groundwater Hydraulic Containment Remedy
4. Former MCAS Tustin Document Status Matrix dated October 12, 2017
5. Updated Former MCAS Tustin Final Amended Site Management Plan, Fiscal Year 2018 Update dated October 10, 2017

ACTION ITEMS

There were no action items from this meeting.

INTRODUCTIONS AND AGENDA REVIEW

Mr. Jim Sullivan, Navy BEC, opened the meeting with self-introductions. A total of 12 people attended the meeting, including Ms. Mary Aycock (U.S. EPA) and Mr. Guy Chammas (Navy), who attended via teleconference.

Project Environmental Review Form (PERF) Discussion

Mr. Ken Piguee (City) stated that the City submitted a PERF for Phase I of the Sports Park at Severyns Road and Valencia Avenue (Parcels 22, 19, and 1). Phase I consists of grading and deep utility installation, along with significant well destruction and some well relocation. Phase II will be construction of the park. The City received a conditional approval letter today from the Navy. The City appreciates the Navy approval and will now look to the Agencies for final approval of the PERF, as the project has been in development since 2006. Mr. Piguee stated that one condition to be discussed with the

Navy and Agencies regarding the conditional approval is the new State of California Maximum Contaminant Level (MCL) for 1,2,3-trichloropropane (TCP). The PERF included a special construction zone (SCZ) with a 150-foot buffer from the 2016 plume boundaries. Mr. Piguet explained that the Navy's conditional approval stipulated that the groundwater area requiring institutional controls (ARIC) boundary should be used rather than the 150-foot buffer boundary. He stated that the City's geotechnical expert reviewed the project and did not think there was an issue with using the 150-foot buffer. The City would like to understand why the boundary needs to be expanded out from the 150-foot buffer when there are no data to support that expansion to the ARIC boundary. The City's other concern is regarding well relocation, but the City is amenable to that condition.

Mr. Matt West continued that the City has already awarded the project and the notice to proceed is contingent upon Agency approval. He stated that the City was not prepared for an in-depth discussion of the project during this meeting, but wanted to bring up the subject while the Agencies and Navy were both present. Mr. Piguet stated that the maximum depth of Phase I work will be approximately 8 feet below ground surface (bgs) for the deep utilities. Mr. Piguet clarified that the letter received this morning was unsigned. Mr. Sullivan explained that the Navy real estate officer would be signing the letter. Mr. Piguet stated that the City would appreciate an expedited review of the letter, and that this PERF for the Sports Park is a priority over any others. Mr. Sullivan asked whether the Agencies had any questions while everyone was present. Ms. Patricia Hannon stated that the RWQCB would like to see the PERF first, before commenting or posing questions.

Mr. West explained that the construction would take place at the former Underground Storage Tank (UST) 222 site location, near the top of the OU-1A North plume and OU-4B (Installation Restoration Program [IRP] Site 13W). Extraction wells located there will be protected in place. The SCZ techniques used at Victory Road are the same as those that will be implemented at the Sports Park: bentonite wrap, fiberglass pipes, and special bentonite backfill. Mr. Piguet stressed that the City will not be interfering with the extraction system, but will be only relocating some monitoring wells and destroying others.

Mr. Sullivan explained that, regarding the ARIC, one consideration is the presence of 1,2,3-TCP and the Navy's current lack of data for it with respect to the new MCL. The Navy is attempting to apply the new 1,2,3-TCP analytical method to the expedited monitoring to be conducted at the end of October 2017, but the requirements may not be able to be met. Mr. West asked whether the inability was because of the lower detection limit for 1,2,3-TCP. Mr. Sullivan indicated that the laboratories could meet the required limit of quantitation, but that it was going to be difficult to prepare the required addenda to the project documents and complete the contract modification in time to fund the sampling. Mr. Piguet reiterated that the City's challenge was that the 150-foot buffer was established, with the aid of a geotechnical expert, on the basis of keeping utilities far outside of the buffer. Now, if the groundwater ARIC is used, some of the planned utilities fall back within the boundaries and within the SCZ, which creates cost and design issues for the City. Mr. Rich Pribyl explained that some of the reasons for the boundary will be clarified once the vapor intrusion (VI) report has been reviewed. For example, in the northern area of the plume, the concern due to trichloroethene (TCE) would be for residential use and for the case where a preferential pathway was created out of the area. Mr. Pribyl discussed that the VI evaluation did not include 1,2,3-TCP because the Navy was unable to collect samples in the TCE plume, but it is possible that there would have been interference because of colocation of 1,2,3-TCP with TCE. To be conservative, the boundaries had been extended. Mr. Piguet asked whether the potential exists for the boundary to be either much broader or much narrower than the ARIC boundary. Mr. Sullivan stated that, based on the data the Navy did have, the 1,2,3-TCP groundwater boundary is not expected to extend beyond the groundwater ARIC. Ms. Christine Bucklin asked that "ARIC" be defined. Mr. Sullivan explained that it was an area requiring institutional controls (ICs) and that those areas needed to be delineated and surveyed to write a covenant or deed so that areas of restriction could be defined.

Because some of the attendees had to leave the meeting early, it was agreed to go through the presentations before discussion of the Site Management Plan schedule.

PFAS Sampling in Groundwater at Operable Unit 3, Installation Restoration Program Site 1
(Presented by Mr. Alex Bollweg, Navy PM) (Attachment 1) RAB dry-run

Slide 1 – Presentation Title

Mr. Sullivan introduced Mr. Alex Bollweg and stated that the presentation was also to be presented at the Restoration Advisory Board (RAB) meeting in the evening.

Slide 2 – Presentation Overview

Slide 3 – Site Location

Mr. Bollweg explained that IRP Site 1/OU-3 is not in a CO area, because it had already been transferred to the City.

Slide 4 – Site Map

The figure shows IRP Site 1 site features and well locations. Mr. Bollweg explained that the site contains five shallow and five deep monitoring wells. He stated that groundwater monitoring well I001MW53S was destroyed earlier this year and that it was located on the east side of the site near Peters Canyon Channel.

Slide 5 – Site History

Mr. Bollweg explained that Former MCAS Tustin IRP Site 1 used to be known as Moffett Trenches and Crash Crew Burn Pits. He stated that approximately 5,000 cubic yards of material primarily consisting of general municipal waste and industrial waste had been buried at the site. Mr. Bollweg explained that firefighting training exercises were conducted at the site from 1971 to 1983, with an estimated 250,000 to 350,000 gallons of liquid waste used for firefighting training.

Mr. Bollweg explained that various volatile organic compounds (VOCs) and metals were the established contaminants of concern at the site, but all have recently been non-detect except for 1,1-dichloroethane, which was detected at monitoring well I001BC50S.

Mr. Bollweg stated that no shallow groundwater is used for drinking water at the site or downgradient from it and the closest water supply well is approximately 1 mile upgradient and cross-gradient.

Slide 6 – Groundwater Sampling

Mr. Bollweg explained that the sum of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) concentrations is also compared with the U.S. EPA Lifetime Health Advisory (LHA) of 0.07 microgram per liter (µg/L), which is the LHA for each of the compounds by themselves. Mr. Bollweg stated that Agency concurrence had been obtained for the Sampling and Analysis Plan (SAP).

Slide 7 – Technical Approach

Mr. Bollweg explained that the French drain system is currently not being used. He described the approximate location of the Crash Crew Burn Pits at the site. The groundwater flow direction in the first water-bearing zone (WBZ) at OU-3 was represented by the blue arrow on the figure. Using the

groundwater flow direction, monitoring well I001BC43S was shown to be upgradient, and monitoring wells I001MW52S and I001BC50S were shown to be downgradient.

Slide 8 – Analytical Results

Mr. Pigee stated that it would be helpful to include the percentage over the screening level for each of the exceedances. Mr. West stated his understanding was that the Navy was sampling its entire portfolio of bases and asked whether the results at Former MCAS Tustin IRP Site 1 were among the highest. Mr. Sullivan explained that he had not seen the complete list, but that the results at OU-3 were likely close to the highest. Mr. Sullivan noted that one consideration could be that the containment wall prevented contamination from spreading and thereby increased concentrations.

Slide 9 – Additional Sampling Event – November 2017

Mr. Bollweg stated that the Final Summary Report associated with the additional sampling event is expected to be submitted in December 2017 or January 2018. Mr. Sullivan stated that the additional sampling event would be similar to the first sampling event and would occur at the end of October 2017; validated data should be received by the end of November 2017, and a written report provided afterward.

Mr. Pigee asked whether future sampling events would be conducted based on the additional sampling at the end of the month. Mr. Sullivan replied that there are no drinking water wells downgradient and the Navy's policy is to protect drinking water. Mr. West asked why there was groundwater treatment at other locations. Mr. Sullivan responded that the Agencies have not promulgated any limits for PFAS except those for drinking water, and that PFAS has not been observed in drinking water wells. Because PFAS are emerging contaminants, they do not yet have cleanup goals. The only regulatory guidance that exists is the guidance for drinking water from the U.S. EPA.

Mr. West asked what the Navy's stance would be should PFASs be found in the second WBZ and whether the Navy would continue sampling to delineate the contamination. Mr. Sullivan explained that at IRP Site 1, only the two shallow aquifers have been monitored and that there is a strong aquitard between the second WBZ and the Principal Aquifer. Mr. West stated that if contamination was found in the second WBZ, the Navy should continue to collect samples at greater depths. Ms. Hannon stated that the upper aquifer under Former MCAS Tustin is divided into three WBZs with discontinuous, less permeable soil layers between each WBZ. She explained further that the WBZs in the northern portion of the facility at IRP Site 13S are coarser grained and more interconnected than the WBZs in the southern portion (IRP Site 3).

Slide 10 – Questions

Mr. West stated that the City understood that the first sampling event was to determine the presence or absence of contamination and asked why further sampling is necessary. Mr. Sullivan explained that the additional monitoring wells include two that are downgradient, two more that are in the first WBZ, and five that are in the second WBZ and would further validate the presence of PFAS. Mr. West stated that the City appreciated the notification of the sampling, but the City would be drafting a response that the sampling plan is not sufficient and should include sampling of the regional channel. He explained that the City would be advocating for a full investigation of the extent of contamination. Ms. Hannon stated that she had a list of actions the RWQCB will be recommending, including (1) proposing to sample other monitoring wells, (2) sampling surface water upgradient and downgradient of the containment wall in Peters Canyon Channel, (3) generating a monitoring program, and (4) proceeding with an additional investigation, based on the results from the recommended sampling. Ms. Aycock explained that she sent out a guidance document she received from the Navy, which describes how the Navy is responding to

PFAS. She stated that if they are found, complete delineation is recommended. She further explained that characterization, which has already been completed, was the first step. Ms. Aycock explained that once data were collected, at some point a risk assessment would be required to see how the area is affected (i.e., homes, water system). She reminded the attendees that there were many items of consideration for the next steps. She suggested everyone review the Navy guidance that was promulgated. Mr. Sullivan asked for a timeframe for when the Navy could expect comments. Mr. West stated that the City letter would be ready by next week. Ms. Hannon stated that the RWQCB requested 30 days.

Ms. Bucklin stated that this program was new to her and she asked about Peters Canyon Channel. Ms. Hannon explained that the channel has a soft bottom and a containment wall that was installed in the 1980s because oil was observed to be seeping from the channel wall. Mr. West stated that the Moffett Bridge was planned for demolition and that the channel area was approximately 2,000 linear feet.

Slide 11 – Acronyms

Mr. Sullivan stated that the next agenda item would be a discussion of the Site Management Plan schedule since some meeting attendees needed to leave the meeting early.

Schedule (Attachment 5)

Mr. Chammas presented proposed updates to the Former MCAS Tustin Final Amended Site Management Plan, Fiscal Year 2018 Update dated October 10, 2017. He stated that the changes reflected extensions to delivery dates for reports. Mr. Chammas noted the documents for which completion dates had been modified: the Final 2016 Performance Evaluation Report and the 2017 Data Summary Report for OU-1A and OU-1B, the Annual Long-Term Monitoring Report for OU-3, and the 2016 Annual Performance Evaluation Report for the OU-4B Moderate Concentration Sites.

Mr. Chammas then asked for Agency questions or concurrence. The RWQCB, U.S. EPA, and DTSC concurred.

Former MCAS Tustin BCT Update for OU-1A and -1B Groundwater Hydraulic Containment Remedy (Attachment 3)

Mr. Chammas introduced the handout and Mr. Pribyl described its contents. Mr. Pribyl explained that there was a new operation and maintenance (O&M) contractor and that a transition meeting was held this morning at the site.

Mr. Pribyl stated that the Fall 2017 annual groundwater monitoring event was planned for the end of October 2017, ideally in the last week. The plan was to begin in the northern portion of OU-1A to avoid the City's work in the Sports Park.

Mr. Pribyl stated that the Draft VI Assessment Report was delivered last week. Mr. Pribyl explained that once this document was complete, the Navy would be able to finalize the Explanations of Significant Differences (ESDs), the Land Use Control Remedial Design (LUC RD) Amendment, and Finding of Suitability to Transfer (FOST) #10.

Mr. West stated that he would be attending the RAB meeting in the evening. He asked how the partial information from VI sampling was sufficient, given that not all planned locations were sampled because of the wet season. Mr. Pribyl stated that factors other than just the rain events prevented sampling, such as local geology and sample volumes (6-liter SUMMA canisters) required for 1,2,3-TCP sampling. Mr. Coleman explained that risk assessors had evaluated the data and feel that there are adequate data from

multiple sources to reach a conclusion. Mr. West replied that he appreciated the response, but he was concerned that, for example, the exceedance around the plume at CO-6 is only on one side of CO-6, but the ARIC still covers the entire CO. Additionally, the exceedances in OU-1B North were limited to the northern portion of the plume, yet the VI ARIC extended over the entire groundwater ARIC/plume extents. His impression was that the sampling was intended to reduce the areal extent of the ARICs. He also stated that it appeared that the proposed CO-5 ARIC had been reduced, but the proposed CO-6 ARIC had not. Mr. West left the meeting at this time.

Mr. Bollweg stated that at OU-3 there was also a new contractor (the same new OU-1 contractor). He stated that there would be an O&M Plan (OMP) addendum as well as additional sampling for PFAS. He noted that the next regular groundwater monitoring event at OU-3 was scheduled for 2020 to support the next five-year review.

Mr. Bollweg stated that there is also a new contractor for OU-4B and there will be an associated addendum to the OMP. He explained that there was a planned monitoring event in December 2017 and that the monitoring well inside Hangar 1 (MPMW06S) would also be destroyed at that time. Mr. Sullivan stated that the schedule for the destruction of the monitoring well inside the hangar was flexible. Mr. Chammas continued that with the PERF work, three monitoring wells associated with IRP Site 13W (one of the OU-4B Low Concentration Sites) would be relocated.

Mr. Chammas explained that at Neighborhood D South, there was one benzene detection (118 micrograms per liter [$\mu\text{g/L}$]) from one of the 10 groundwater sampling locations, in the center of Area 2. Mr. Chammas explained that Mr. Piguee had asked what would happen if the groundwater level rose. Mr. Chammas said that the groundwater level was currently approximately 14 feet below the finished grade. He stated that a modified version of the Johnson and Ettinger model had been run to estimate any VI risk to the residential property that would be placed at the location of the exceedance, assuming a water table at 10 feet below grade, and there was no unacceptable cancer risk or noncancer hazard associated with the benzene exceedance. Mr. Piguee stated that the City had not yet looked at the modeled data, and that they would need a short extension. Mr. Chammas stated that the comments were originally due tomorrow, but that an extension would be possible.

Mr. Chammas stated that FOST #9 was completed in March 2017, the Covenant to Restrict Use of Property (CRUP) language is being finalized with Navy legal counsel and with the City, and that the Agencies could expect the relevant deed language and CRUP for review soon. Mr. Sullivan stated that there is a new Navy attorney for Tustin (Shannon Fagan) who is located in the San Francisco office and would replace Mike Tencate. Mr. Piguee stated that the City's special counsel had not yet been contacted by Navy legal counsel. Mr. Chammas stated that there was also a new DTSC attorney who may be replacing Erika Giorgi for Former MCAS Tustin.

Mr. Chammas stated that FOST #10 is closely tied with the VI assessment and would incorporate the new ARICs. He said that the preparation is ongoing and that the Agencies could expect a draft at the beginning of the year and a final version by March 2018. The Navy expects to transfer remaining property by the end of the fiscal year, September 30, 2018.

Document Status Matrix (Attachment 4)

Mr. Chammas reviewed the document status matrix. During discussion of FOST #10, he stated that FOST #10 would be completed pending finalization of the VI assessment, LUC RD Amendment, and ESDs. Mr. Chammas stated that the VI assessment was the top priority, with the comments for the Neighborhood D-South Site Assessment Report being secondary. The Navy has not received comments on the

Neighborhood D South Site Assessment Report. He stated that the LUC RD Amendment and ESDs would be prepared after or in parallel with the VI Assessment Report.

Mr. Chammas stated that there would be a field change notification to sample the additional wells at IRP Site 1. Because new contractors are coming onboard for all OUs, addenda to the OMPs and sampling and analysis plans (SAPs) will be prepared for Agency review in the November–December 2017 timeframe.

Mr. Chammas stated that the minutes from the most recent April BCT meeting still require BCT review and comment or concurrence.

COs 5 and 6, Vapor Intrusion Assessment Update, Former Marine Corps Air Station Tustin, Tustin, California (Presented by Mr. Rich Pribyl, Navy PM, and Mr. Derrick Coleman, Tetra Tech) (Attachment 2) RAB-dry run

Mr. Sullivan explained that this presentation is also a dry run for the RAB meeting this evening.

Slide 1 – Presentation Title

Mr. Pribyl introduced Mr. Coleman (Tetra Tech), who continued the remainder of the presentation.

Slide 2 – Presentation Overview

Slide 3 – Carve-Out 5: Background

The figure shows the CO-5 boundary, the first and second WBZ TCE and 1,2,3-TCP plume boundaries, and the location of Hangar 1.

Mr. Coleman explained that the concern for VI was from groundwater contamination vaporizing into the interstitial spaces above the water table.

Mr. Pribyl explained that the areas in CO-5 where *in situ* bioremediation was the groundwater remedial action were in the monitoring phase.

Slide 4 – Carve-Out 6: Background

The figure shows the CO-6 boundary and the first and second WBZ TCE plume boundaries in relation to Hangar 2.

Slide 5 – VI Assessment Objectives

Mr. Coleman stated that concentrations of TCE and 1,2,3-TCP were to be evaluated, along with TCE degradation products. He explained that subslab soil vapor samples were collected at locations where buildings proximate to groundwater plumes might be reused. Mr. Coleman stated that the human health risk assessment was completed to evaluate ICs to address VI. He described how the VI ICs would contribute to the finalization of ESDs and the LUC RD Amendment.

Slide 6 – VI Assessment Approach

Mr. Coleman explained that the VI assessment required the development of project action levels (PALs) in coordination with DTSC. He stated that a sampling grid was established across the groundwater plumes to evaluate soil vapor levels where they were presumably impacted most by groundwater.

Mr. Piggee asked whether the 0.5 µg/L 1,2,3-TCP remediation goal matched the new state MCL. Ms. Hannon stated that 0.005 µg/L was the new state MCL and 0.05 µg/L was the level at which the well must be shut down or a different approach must be taken. Ms. Hannon confirmed that the soil vapor sampling was completed before the MCL was promulgated. The groundwater screening levels used to identify VI assessment areas of interest, though consistent with the current remediation goals for groundwater, were developed independently to identify where groundwater concentrations of a certain magnitude might present a VI risk. These screening levels provided objective criteria for defining the initial spatial boundaries for the VI assessment.

Slide 7 – Field Implementation

Mr. Coleman described the field implementation that occurred between December 2016 and March 2017. He stated that the area of Former MCAS Tustin is approximately 1,592 acres, CO-5 is approximately 200–215 acres (approximately 13% of the total), and CO-6 is approximately 30–35 acres (approximately 2% of the total). Mr. Coleman stated that four to six people, including both Tetra Tech and subcontractor personnel, were involved in the field implementation at the site.

Slide 8 – Field Implementation (continued)

This slide shows a photograph of the installation of a soil vapor monitoring probe. Mr. Coleman described the probe installation as hand augering for the first 5 feet (for utility avoidance) followed by direct push of the Geoprobe. He explained that soil vapor samples were collected between 3 and 20 feet bgs, but that depths varied within the different OUs: OU-1A included samples at depths between 14 and 20 feet bgs, OU-4B included samples between 4 and 12 feet bgs, and OU-1B South included samples between 3 and 12 feet bgs.

Slide 9 – Field Implementation (continued)

Slide 10 – Field Implementation (continued)

Mr. Coleman described some of the challenges during field implementation, including significant rain events between December 2016 and February 2017, when groundwater levels rose over 4 feet in some locations and flooded the soil vapor probes. No soil vapor samples could be collected at those locations. In addition, Mr. Coleman explained that the rains caused excessive weed growth and made it difficult for field teams to find the probes that had been installed. In addition, multiple soil vapor well tubes were damaged by animals. There were some limited impacts due to grading that occurred at the sites.

Slide 11 – Carve-Out 5: OU-1A ARIC Assessment

Mr. Coleman described the 49 soil vapor probes that were installed (primarily for TCE sampling) and 26 samples that were collected.

Mr. Piggee asked about the grid used for installation of the probes and whether the count of 49 installed probes included those for step-out samples. Mr. Pribyl stated that the count did include step-out samples for TCE and 1,2,3-TCP at selected locations. He explained that both rings around the plumes were installed at the same time and samples were collected later, as needed.

Mr. Piggee asked whether there was a data gap in one area of the plume where samples were not collected. Mr. Pribyl explained that samples were not collected in some locations because of either precipitation or local geology (silty clay and clay). He stated that the samples within the plume were representative, but not in grid locations. Mr. Piggee asked whether data were missing for any

particular locations because of the rain events. Mr. Pribyl explained that rain events or local geological variations alone did not prevent sampling at particular locations. Mr. Coleman explained that the lighter pink color in the map shows the shallow WBZ plumes, while the darker colors are in the second WBZ. The pink is TCE and the green is 1,2,3-TCP. Mr. Pribyl stated that, with regard to the question Mr. West asked, an earlier slide showed the source areas farther north than the rest of the plume. Those areas would be expected to have higher concentrations of TCE and 1,2,3-TCP in soil vapor. In areas where there are 1,2,3-TCP data from inside the plume, the concentrations are 436 times the PAL. Mr. Pribyl stated that the Navy concerns were how long it would take for the concentrations to decrease and, depending on a specific redevelopment scenario, whether or not preferential pathways would be created by proposed construction (such as construction of a parking lot with a large slab trapping contaminants underneath it).

Slide 12 – Carve-Out 5: OU-4B ARIC Assessment

Mr. Coleman stated that OU-4B sampling was similar to sampling at OU-1A, except with subslab samples taken. Mr. Coleman explained that because of building safety concerns, no subslab samples were collected from within Building 28 (Hangar 1); however, near-slab perimeter samples were collected.

Slide 13 – Carve-Out 5: OU-1A ARIC Assessment

Mr. Coleman stated that a correction was required to the slide: the TCE PAL should be $480 \mu\text{g}/\text{m}^3$ rather than $9.6 \mu\text{g}/\text{m}^3$.

Slide 14 – Carve-Out 6: OU-1B South ARIC Assessment

Slide 15 – Human Health Risk Assessment Summary

Slide 16 – Human Health Risk Assessment Summary

Mr. Sullivan explained that the reported risks did differentiate between large spaces and partitioned spaces in Hangar 2. Mr. Piggee reiterated that the indoor sampling was minimal.

Slide 17 – Recommended IC Framework to Address VI

Mr. Coleman explained that the intent was to have an OU-1A ARIC that would be both implementable as well as protective.

Mr. Coleman stated that the OU-4B ARIC is less restrictive. Mr. Sullivan highlighted that only a notification that VOCs are present in groundwater is required; there is no use restriction. Mr. Piggee asked whether a notification is similar to that being discussed for CO-2 and clarified that a notification provides information and a restriction prohibits use. Mr. Sullivan stated that the restriction does not prohibit a use, but that the restriction language would be provided in the ESDs and LUC RD Amendment where VI is required to be addressed, based on the reuse and redevelopment scenario. Mr. Piggee asked whether the notification is required by Navy guidance, stating that the original boundary was the CO boundary, and now is the groundwater ARIC. Messrs. Sullivan and Pribyl replied that it was required by Navy guidance. Mr. Pribyl stated that restrictions would be applied to redevelopment and reuse. Mr. Sullivan stated that the restriction would require an evaluation. Mr. Pribyl explained that, based on the evaluation, the site may require mitigation or that special construction methods may be used. Mr. Piggee asked why the area in CO-5 requires notification if sampling results are below the PALs. Mr. Sullivan replied that it requires notification because of the presence of VOCs in the groundwater.

Mr. Pribyl stated that the restrictions were based on current conditions and sampling results from areas around the hangar and not from within Hangar 1 itself. He stated that if Hangar 1 were removed, the restrictions would need to be assessed.

Mr. Piguee asked why there was a large green area on the figure (the area in the map requiring notification) if the vertical limit of the plume is smaller. Mr. Sullivan stated that the Navy will respond to the City's comments once they are provided. Mr. Piguee stated that the City was concerned about the leading edge of the plume (OU-1B North) and how it relates to the results of the soil vapor samples that were collected. Mr. Pribyl stated that the groundwater model used indicates that plume capture is occurring.

Slide 18 – CO-6: Recommended IC Framework to Address VI

Slide 19 – Schedule

Mr. Pribyl stated that there has already been an extensive review of the Revised Draft Final ESDs for OU-1A and OU-1B and LUC RD Amendment No. 1 for OU-1A and OU-1B concerning the appropriate limits for ICs.

Slide 20 – Acronyms and Abbreviations

REVIEW ACTION ITEMS/NEXT MEETING

There were no action items from the meeting.

There were no further comments or questions.

The meeting was adjourned at 5:20 p.m.

Per- and Polyfluoroalkyl Substances (PFAS) Sampling in Groundwater at Operable Unit 3, Installation Restoration Program Site 1 Former Marine Corps Air Station Tustin Tustin, California

Restoration Advisory Board Meeting
Alex Bollweg, Contracted Project Manager

12 October 2017

Presentation Overview



- **Background**

- Site Location
- Site Map
- Site History

- **Groundwater Sampling**

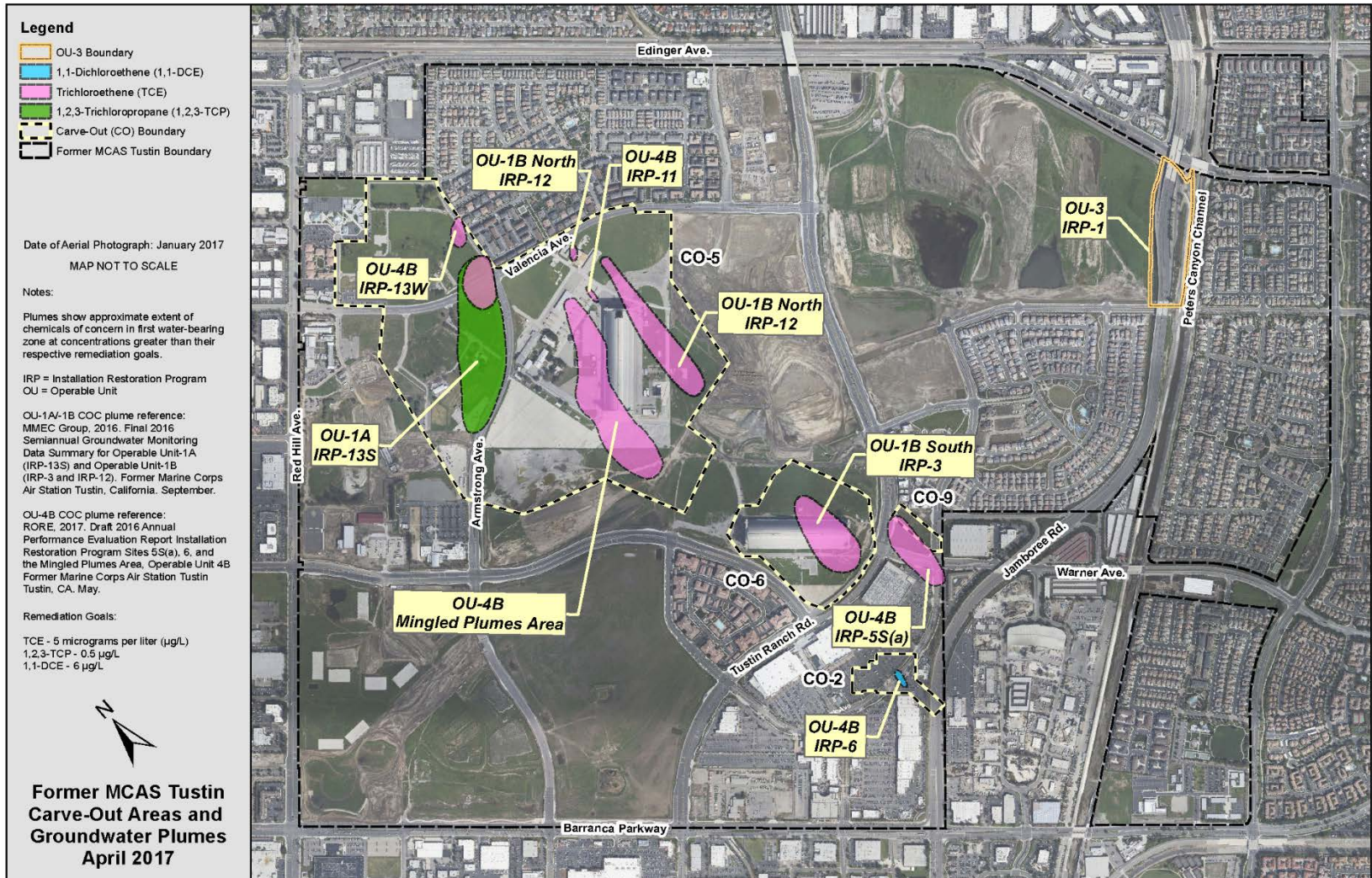
- **Technical Approach**

- **Analytical Results**

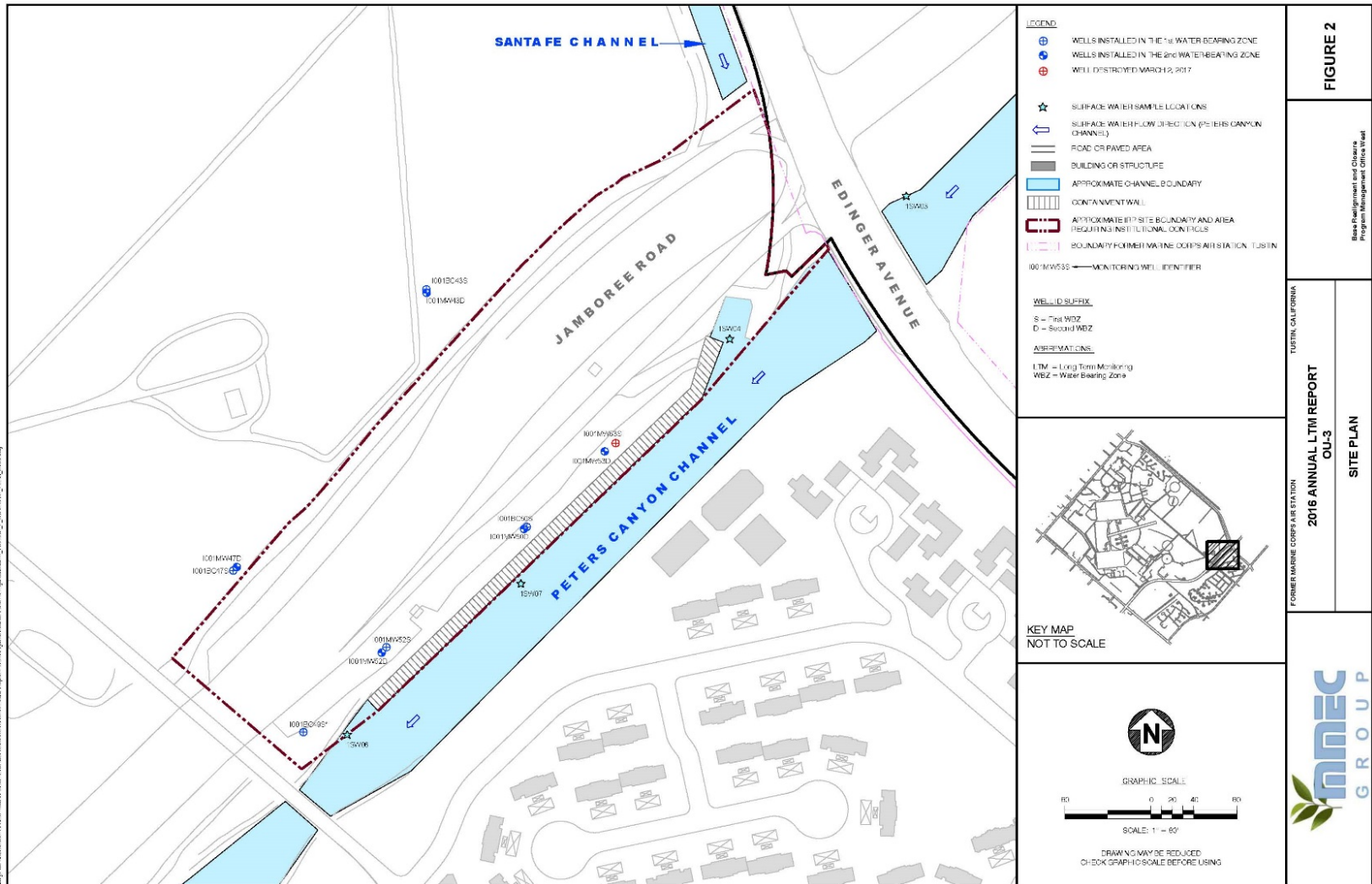
- **Additional Sampling Event – November 2017**

- **Questions**

Site Location



Site Map



Site History



- **Moffett Trenches and Crash Crew Burn Pits**
- **Trenches used from late 1940s/early 1950s until about 1971**
 - Approximately 5,000 cubic yards of material
- **Firefighting training exercises from 1971 to 1983**
- **Primary Chemicals of Concern in Groundwater**
 - Various volatile organic compounds
 - Various metals
- **Shallow groundwater is not used for drinking water**
- **Closest water supply well is approximately 1 mile upgradient**

Groundwater Sampling



- **Single Groundwater Sampling Event for PFAS**

- **Presence or absence of PFAS compounds, with focus on 3 for which screening levels exist:**

- perfluorooctanesulfonic acid (PFOS)
 - perfluorooctanoic acid (PFOA)
 - perfluorobutanesulfonic acid (PFBS)

- **Screening levels**

- May 2016 United States Environmental Protection Agency Lifetime Health Advisory for PFOS and PFOA (0.07 microgram per liter [µg/L])
 - June 2017 United States Environmental Protection Agency Regional Screening Level for PFBS (400 µg/L)

- **Regulatory concurrence obtained**

- **Sampling of 3 representative groundwater monitoring wells**

- **1 upgradient (I001MW43S)**

- **2 downgradient (I001MW50S and I001MW52S)**

Technical Approach



- Well I001BC43S was selected to evaluate the potential presence of PFAS in groundwater upgradient of the former Crash Crew Burn Pit.
- Wells I001BC50S and I001MW52S were selected to determine presence or absence of PFAS downgradient of the historical disposal trenches and former Crash Crew Burn Pits.

➡ Groundwater flow direction

□ Sampled Wells



Analytical Results



PFOA, PFOS, and PFBS Laboratory Analysis Results Summary, July 2017

		PFOA	PFOS	PFOA + PFOS	PFBS
U.S. EPA Lifetime Health Advisory ¹		0.07	0.07	0.07	-
U.S. EPA Tap Water Regional Screening Level ²		-	-	-	400
Well ID	Sample Date				
I001BC43S	7/24/2017	0.397 µg/L	0.0263 µg/L	0.423 µg/L	0.0624 µg/L
I001BC50S	7/24/2017	6.84 µg/L	1.16 µg/L	8.00 µg/L	1.07 µg/L
I001MW52S	7/24/2017	743 µg/L	26.9 µg/L	770 µg/L	66.7 µg/L
I001MW52S ³	7/24/2017	637 µg/L	18.1 µg/L	655 µg/L	61.7 µg/L

Notes:

1. PFOA and PFOS screening levels are based on the U.S. EPA LHA for public drinking water (U.S. EPA, 2016a). The screening value of 0.07 µg/L will also be used as the sum of PFOA and PFOS when they are both present.
2. PFBS screening level is based on June 2017 U.S. EPA tap water RSL (U.S. EPA, 2017).
3. Duplicate sample from the same well.

Result exceeds U.S. EPA Screening Levels

µg/L = micrograms per liter; LHA = Lifetime Health Advisory; PFOA = perfluorooctanoic acid; PFOS = perfluorooctane sulfonate; PFBS = perfluorobutanesulfonic acid; RSL = regional screening level

Additional Sampling Event – November 2017



- **Sample all 10 existing groundwater monitoring wells**
 - 5 in first water-bearing zone
 - 5 in second water-bearing zone
- **Summary Report will be submitted in December or January**



Questions



Acronyms



BRAC	Base Realignment and Closure
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutanesulfonic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
µg/L	microgram(s) per liter

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Carve-Outs 5 and 6 Vapor Intrusion Assessment Update

Former Marine Corps Air Station Tustin Tustin, California

Restoration Advisory Board Meeting

Richard Pribyl, Contracted Navy Project Manager

Derrick Coleman, Senior Hydrologist, Tetra Tech EC, Inc.

12 October 2017

Presentation Overview



- **Background for CO-5 and CO-6**
 - Source Areas /Chemicals of Concern (COCs)
 - Previous Remedial Actions
 - Institutional Controls (ICs)
- **Vapor Intrusion (VI) Assessment Objectives**
- **VI Assessment Approach**
- **Field Implementation**
- **Human Health Risk Assessment Summary**
- **Area Requiring IC (ARIC) Assessment**
- **Recommended IC Framework to Address VI**
- **Schedule**

Carve-Out 5: Background

• Source Areas/COCs

- Operable Unit (OU)-1A:
1,2,3-trichloropropane (TCP) and
trichloroethene (TCE)
- OU-4B: TCE
- OU-1B North: TCE

• Soil Remedial Actions

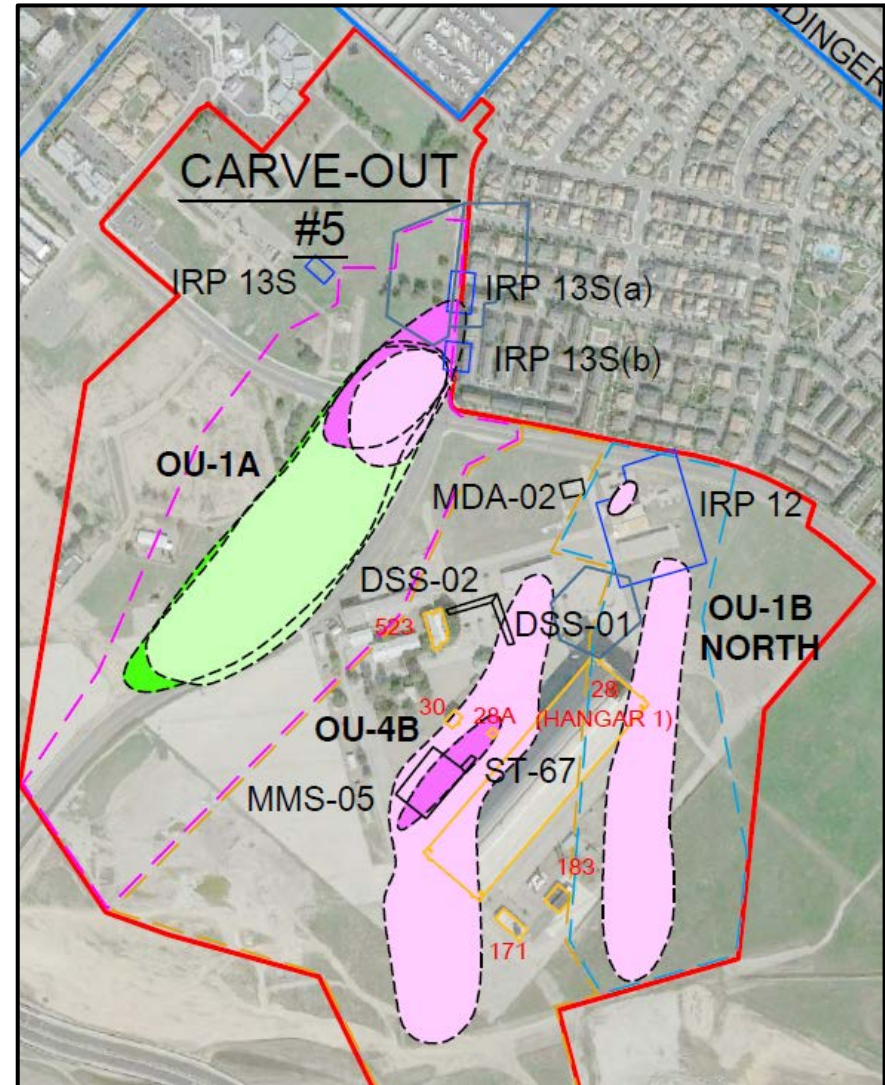
- Hot-Spot Removal/Excavation
- No Further Action (NFA) for all OUs

• Groundwater Remedial Actions

- Hot-Spot Groundwater Extraction and
Hydraulic Containment
- Performance Monitoring
- In Situ Bioremediation
- Monitored Natural Attenuation

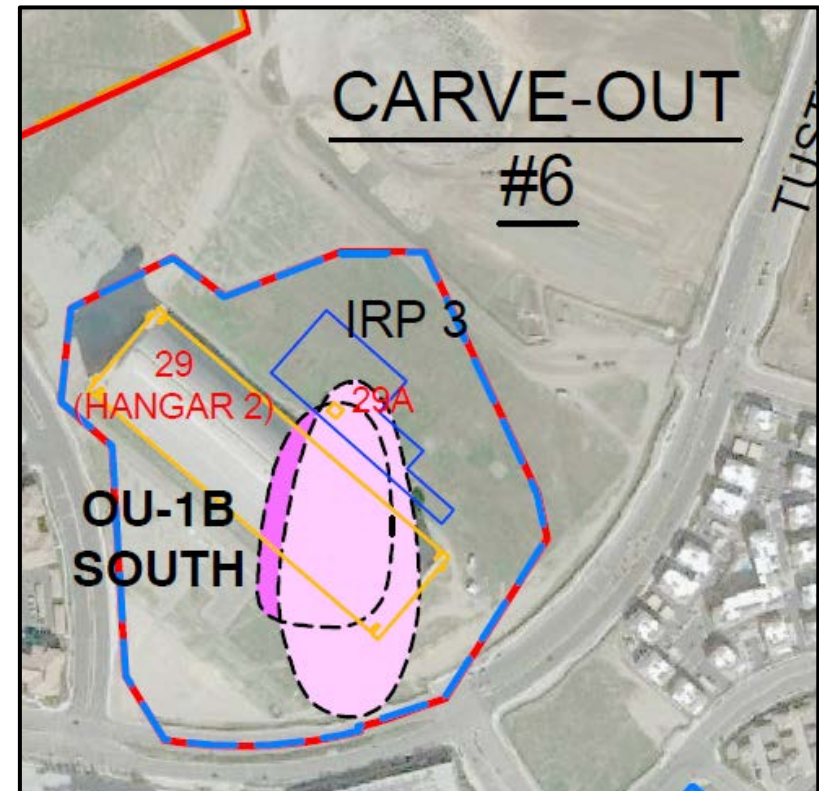
• Institutional Controls

- Groundwater only, to date



Carve-Out 6: Background

- **Source Area/COC**
 - OU-1B South: TCE
- **Soil Remedial Actions**
 - Hot-Spot Removal/Excavation
 - NFA
- **Groundwater Remedial Actions**
 - Hot-Spot Groundwater Extraction and Hydraulic Containment
 - Performance Monitoring
- **Institutional Controls**
 - Groundwater only, to date



VI Assessment Objectives



- **Assess 1,2,3-TCP and/or TCE soil vapor concentrations in CO-5 and CO-6**
- **Compare soil vapor and subslab soil vapor data to regulatory-approved project action limits (PALs)**
- **Complete a Human Health Risk Assessment**
- **Establish VI ICs using multiple lines of evidence to protect current receptors and future receptors under a variety of possible reuse scenarios**
- **Finalize Explanations of Significant Differences (ESDs) and Land Use Control Remedial Design (LUC RD) Amendment**

VI Assessment Approach

- **Assessment area included the entirety of CO-5 and CO-6**
- **Focused assessment areas are where contaminant concentrations in groundwater [GW] > corresponding remediation goal + added perimeter**
 - [TCE] in GW = 5 micrograms per liter ($\mu\text{g/L}$)
 - [1,2,3-TCP] in GW = $0.5 \mu\text{g/L}$
 - 100-foot perimeter applied
- **Collect soil vapor and subslab soil vapor samples and compare with respective PALs:**
 - [1,2,3-TCP] in soil vapor = 0.14 micrograms per cubic meter ($\mu\text{g/m}^3$)
 - [TCE] in soil vapor = $480 \mu\text{g/m}^3$
 - [TCE] in subslab soil vapor = $9.6 \mu\text{g/m}^3$
- **Approach and PALs developed in coordination with California Department of Toxic Substances Control**

Field Implementation

- Dates/Duration
- Acres Investigated
- Personnel Deployed



Field Implementation (continued)

- Field Equipment
- Fixed Lab
- Mobile Lab



Field Implementation (continued)



• Probes Installed

- Subsurface probes [109]
- Subslab probes [12]

• Samples Collected

- Subsurface soil vapor for 1,2,3-TCP [7]
- Subsurface soil vapor for TCE [83]
- Subslab soil vapor [13]



Field Implementation (continued)



• Challenges



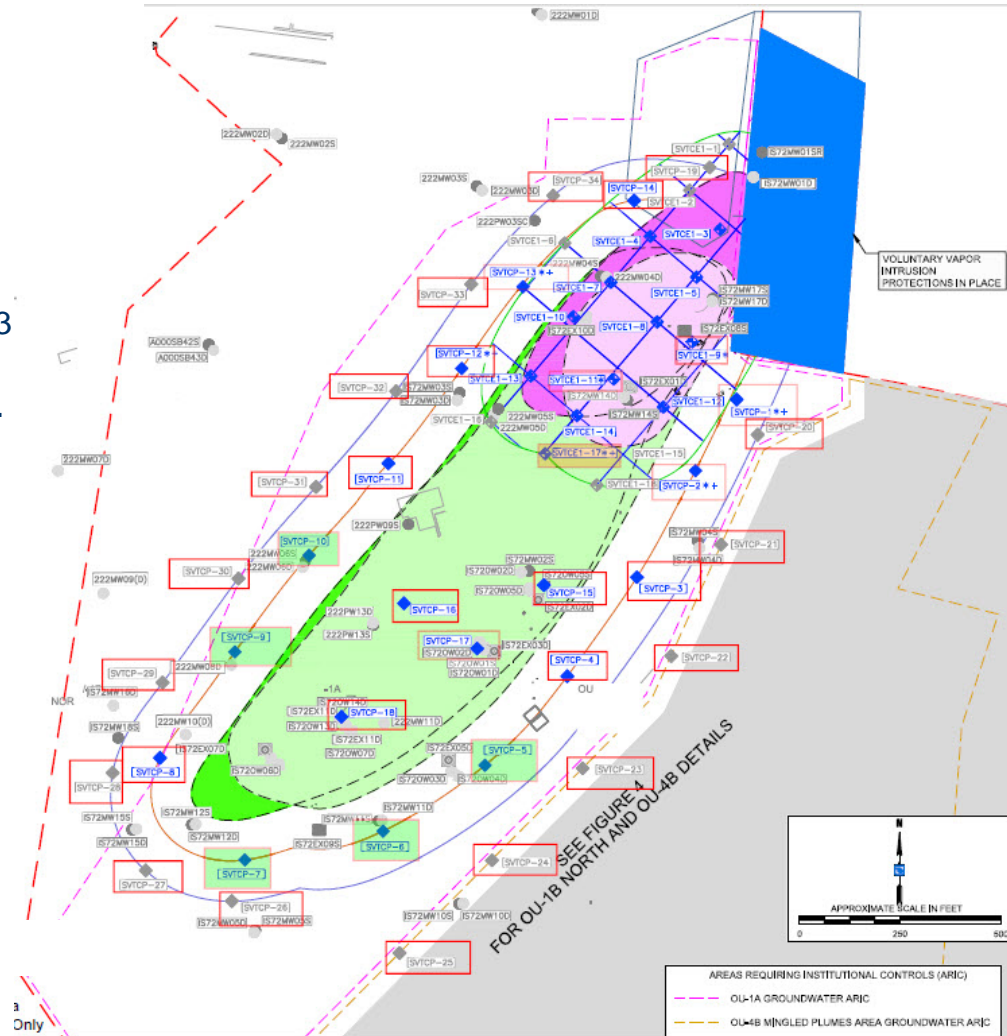
Carve-Out 5: OU-1A ARIC Assessment

•Soil Vapor Assessment

- 49 soil vapor probes installed
- 26 samples collected

•Data Range and Summary

- [1,2,3-TCP]: ND (0.12) to 61 $\mu\text{g}/\text{m}^3$
- [1,2,3-TCP]: 5 of 7 samples < PAL (0.14 $\mu\text{g}/\text{m}^3$)
- [TCE]: ND (22) to 7,000 $\mu\text{g}/\text{m}^3$
- [TCE]: 14 of 19 samples < PAL (480 $\mu\text{g}/\text{m}^3$)



Carve-Out 5: OU-4B ARIC Assessment

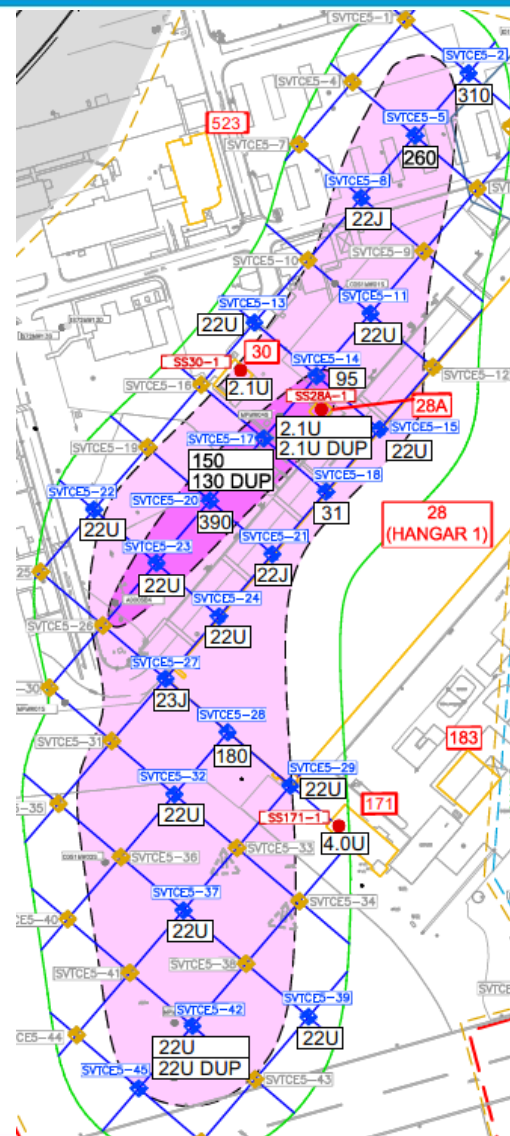


•Soil Vapor Assessment

- 21 soil vapor probes installed
- 23 samples collected
- [TCE]: ND (22) to 390 $\mu\text{g}/\text{m}^3$
- [TCE] in soil vapor < PAL (480 $\mu\text{g}/\text{m}^3$) in all samples

•Building Assessment

- Buildings: 28, 28A, 30 & 171
- 3 subslab probes installed
- 4 samples collected
- [TCE]: ND (2.1) to ND (4.0) $\mu\text{g}/\text{m}^3$
- [TCE] in soil vapor < PAL (9.6 $\mu\text{g}/\text{m}^3$) in all samples



Carve-Out 5: OU-1B North ARIC Assessment

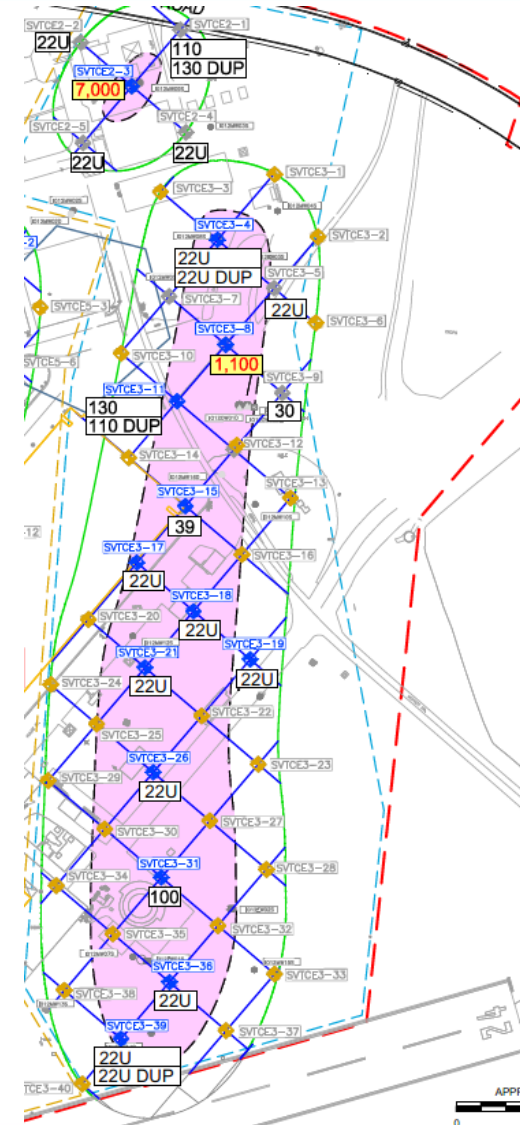


•Soil Vapor Assessment

- 20 soil vapor probes installed
- 23 samples collected

•Data Range and Summary

- [TCE]: ND (22) to 7,000 $\mu\text{g}/\text{m}^3$
- [TCE]: 21 of 23 samples < PAL (9.6 $\mu\text{g}/\text{m}^3$)

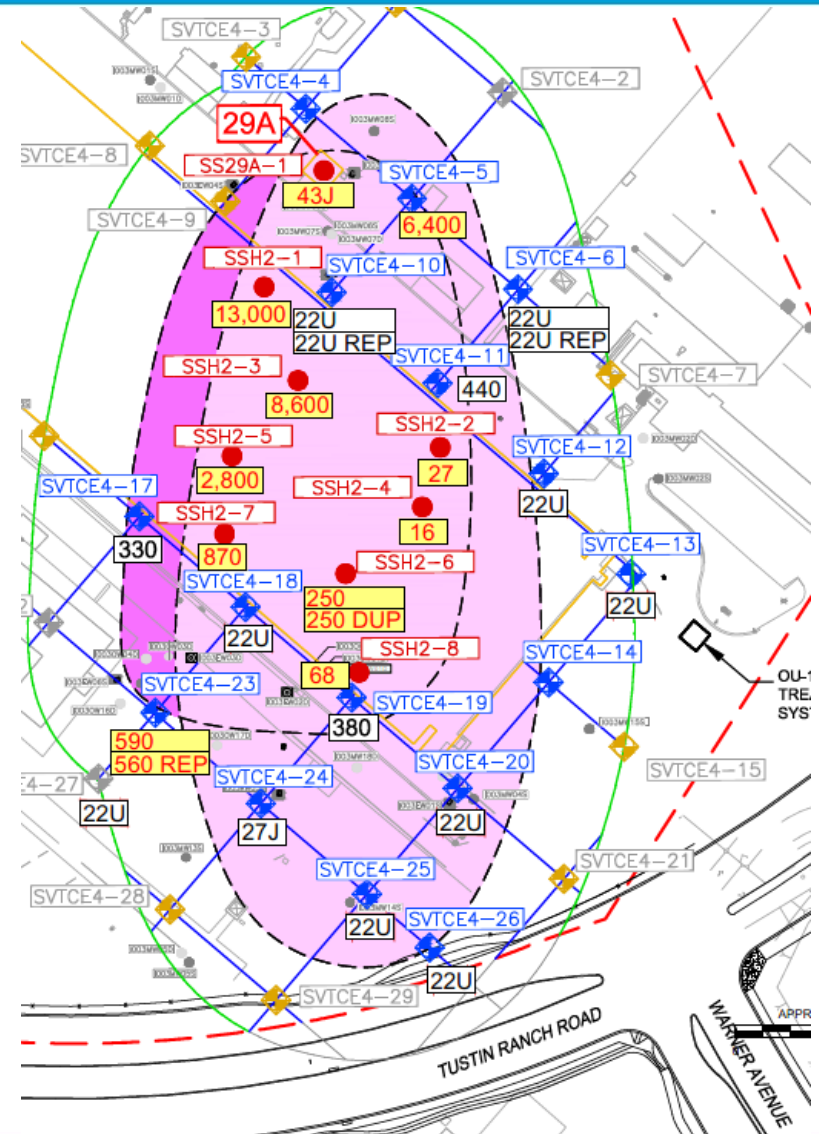


- **Soil Vapor Assessment**

- 19 soil vapor probes installed
- 18 samples collected
- [TCE]: ND (22) to 6,400 $\mu\text{g}/\text{m}^3$
- [TCE]: 15 of 18 samples < PAL (480 $\mu\text{g}/\text{m}^3$)

- **Building Assessment**

- Buildings: 29 & 29A
- 9 subslab probes installed
- 10 samples collected
- [TCE]: 16 to 13,000 $\mu\text{g}/\text{m}^3$
- [TCE]: all samples > PAL (9.6 $\mu\text{g}/\text{m}^3$)



Human Health Risk Assessment Summary



• CO-5

- OU-1A: Risks from 1,2,3-TCP in soil vapor $> 1 \times 10^{-6}$ for residential and commercial use along centerline of plume
- OU-1A: Risks from TCE in soil vapor $> 1 \times 10^{-6}$ for residential only for maximum detected
- OU-4B: Risks from TCE in soil vapor $< 1 \times 10^{-6}$ and hazard index < 1 for all locations and receptor groups (residential, commercial/industrial, construction)
- OU-1B North: Risks from TCE in soil vapor $> 1 \times 10^{-6}$ for residential for maximum concentration detected
- Buildings 28A, 30, 171: Risks from TCE in subslab vapor samples $<$ risk thresholds
- Buildings 183, 523: Beyond 100' buffer and no preferential pathways, therefore not sampled
- Hangar 1: Not sampled, but risks from TCE in adjacent soil vapor samples $< 1 \times 10^{-6}$ for all locations and receptor groups

Human Health Risk Assessment Summary



- **CO-6**

- OU-1B South: Risk from TCE in soil vapor $> 1 \times 10^{-6}$ for residential only, for maximum concentration detected
- Hangar 2: Risks from TCE and degradation products in subslab vapor samples $>$ risk thresholds for residential and commercial use for office areas or other partitioned areas

CO-5: Recommended IC Framework to Address VI



- **OU-1A ARIC**

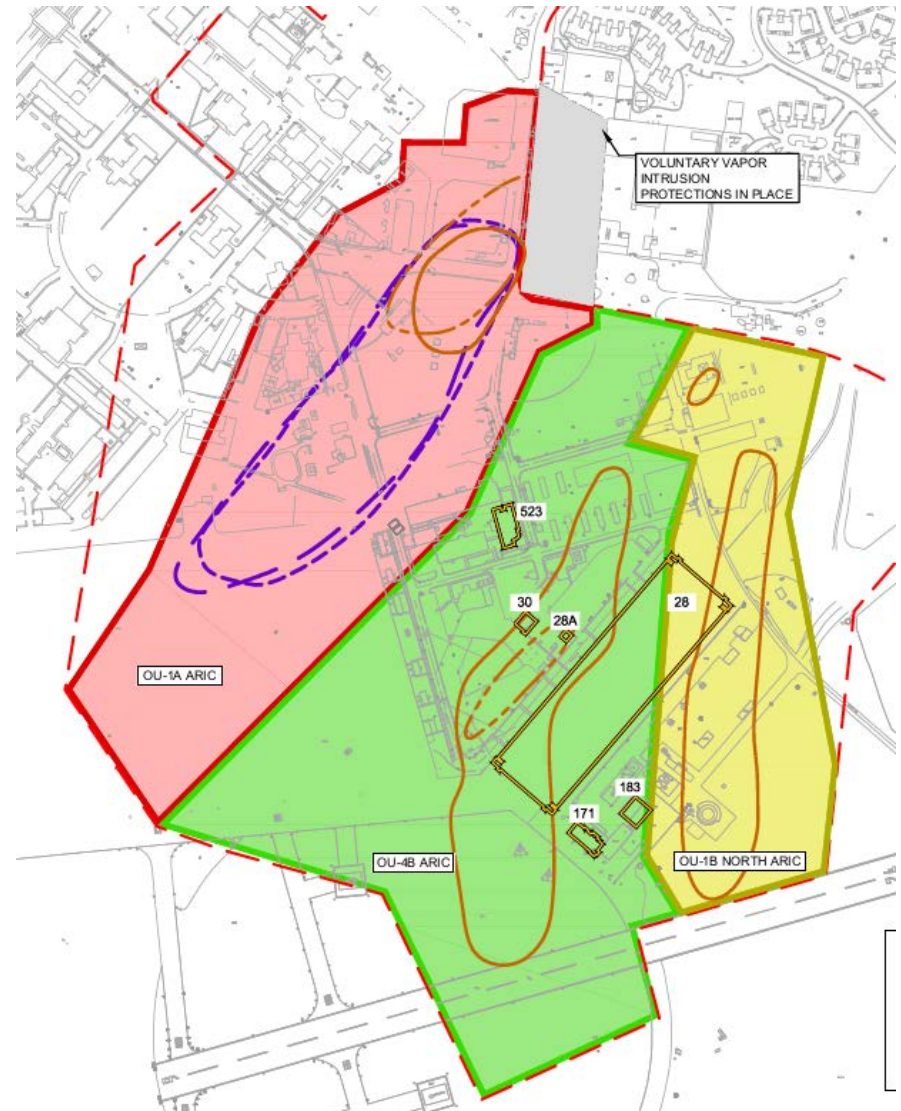
- Restricts future residential and commercial/industrial use
- Coincident with existing groundwater ARIC

- **OU-4B ARIC**

- Notification only

- **OU-1B North ARIC**

- Restricts future residential use
- Coincident with existing groundwater ARIC



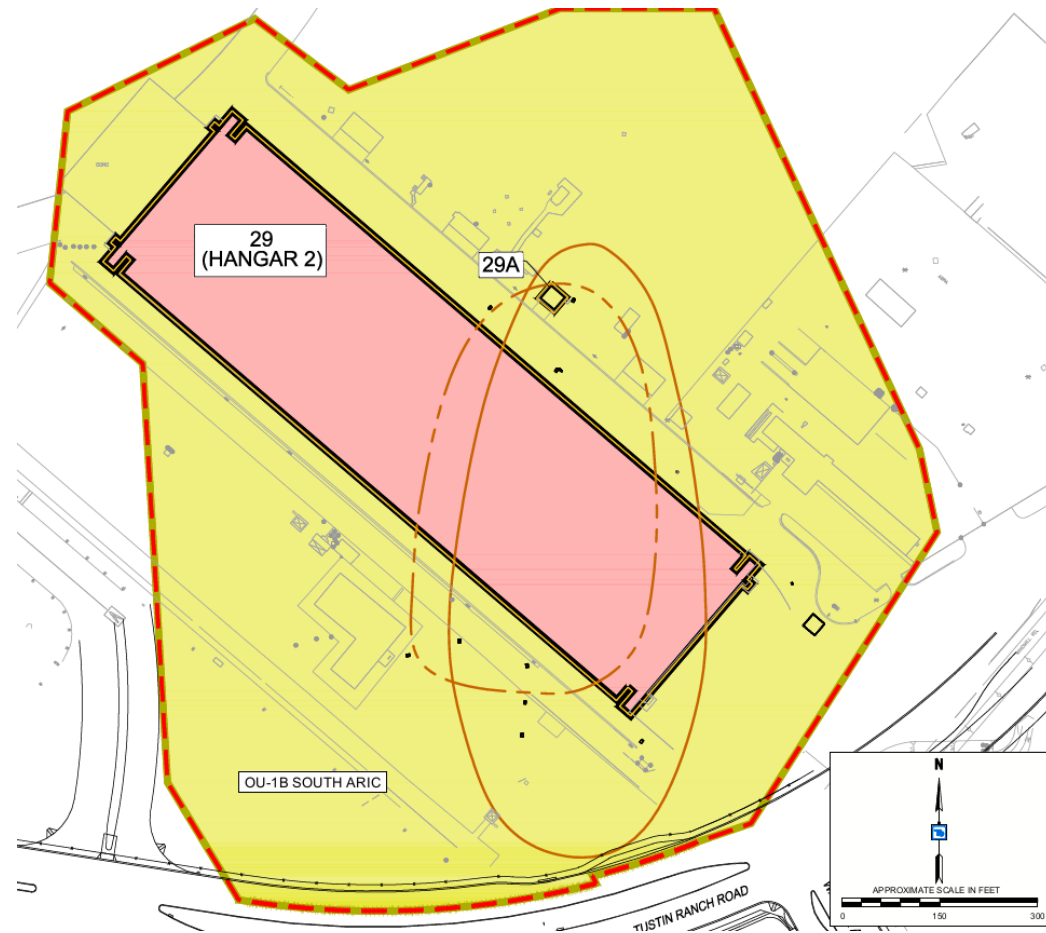
CO-6: Recommended IC Framework to Address VI

• OU-1B South ARIC

- Restricts future residential and commercial/industrial use
- Coincident with existing groundwater ARIC

• Hangar 2

- Existing interior workspaces should not be used for residential or commercial use in the absence of mitigation.
- Any future commercial or industrial reuse of the main hangar bay should not include partitioning into smaller enclosed or partially enclosed spaces.



Schedule



- **Final Technical Memorandum (submitted 31 July 2017)**
- **Draft VI Assessment Report (submitted 6 October 2017)**
- **2nd Revised Draft Final ESD for OU-1A (December 2017)**
- **2nd Revised Draft Final ESD for OU-1B (December 2017)**
- **2nd Revised Draft Final LUC RD Amendment No. 1 for OU-1A and OU-1B (December 2017)**

Acronyms and Abbreviations



- **ARIC** – area requiring institutional controls
- **CO** – carve-out
- **COC** – chemicals of concern
- **ESD** – explanation of significant differences
- **IC** – institutional control
- **LUC** – land use control
- **OU** – operable unit
- **PAL** – project action limit
- **RD** – remedial design
- **TCE** – trichloroethene
- **TCP** – trichloropropane
- **VI** – vapor intrusion



Former MCAS Tustin, California BCT Update

October 12, 2017



Operable Unit (OU) -1A and -1B Groundwater Hydraulic Containment Remedy

The following optimization and O&M elements have been conducted at Operable Units 1A (IRP-13S) and 1B (IRP-3 and IRP-12) in 2017:

- Preventative maintenance included installing new extraction well vent filters, pump cleaning, and cleaning strainers and changing string filters monthly.
- Optimization measures included adjusting flow rates and verification of set points.
- Minor system adjustments included installing a new programmable logic controller, responding to pump alarms, replacing a new water level meter, resetting water level sensors and extraction well flowrates to account for winter rainfall.

O&M was effective and enabled a 99% uptime operating efficiency at both the OU-1A/-1B North and the OU-1B South treatment systems.

OU-1A/-1B North System

- Current Extraction/Treatment Rate: approximately 13.4 gpm (9/29/17).
- Total Volume Groundwater Treated (through 9/29/17): approximately 124,372,000 gallons.
- Total 1,2,3-TCP/TCE Mass Recovered (through 12/31/16*): approximately 6 lbs/10 lbs.

OU-1B South System

- Current Extraction/Treatment Rate: approximately 6.7 gpm (9/29/17).
- Total Volume Groundwater Treated (through 9/29/17): approximately 50,584,000 gallons.
- Total TCE Mass Recovered: (through 12/31/16*): approximately 156 lbs.

Report Schedule Milestones:

- Final 2016 Annual Performance Evaluation Groundwater Remedy Report for OU-1A/-1B – delivered September 8, 2017.
- Final 2017 Semiannual Groundwater Monitoring Data Summary for OU-1A/-1B – delivered October 6, 2017.
- Draft 2017 Annual Performance Evaluation Groundwater Remedy Report – Winter 2017.

Field Schedule Milestones:

- Semi-Annual Groundwater Monitoring event – completed in July 2017.

Upcoming Field Schedule Milestones:

- Annual Groundwater Monitoring Event – Fall 2017.

* Total mass recovered will be updated in December 2017 after the annual extraction well sampling data are collected.

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DOCUMENT STATUS MATRIX
FORMER MCAS TUSTIN
12 October 2017

SUBMITTED	Version	DATE TO BCT		Comments
		Planned	Actual	Due
Remedial Design/Remedial Action Vapor Intrusion Assessment Report for Carve-Outs 5 and 6	Draft	10/6/2017	10/6/2017	11/6/2017
Neighborhood D-South Site Assessment and Soil Removal Action Report	Draft		9/13/2017	10/13/2017
2016 Annual Performance Evaluation for OU-1A/B	Final		9/8/2017	N/A
2017 Semiannual Data Summary for OU-4B MCS	Final		10/4/2017	N/A
2017 Semiannual Groundwater Monitoring Data Summary for OU-1A/B	Final		10/6/2017	N/A
Summary Report: PFAS Sampling for Groundwater Remedial Action at OU-3/IRP Site 1	Final		10/12/2017	N/A

UPCOMING – FOR REVIEW

FOST #9 Covenants to Restrict Use of Property	Draft	10/19/2017		
Land Use Control (LUC) Remedial Design (RD) Amendment for OU-1A and OU-1B	Rev. Draft Final	11/3/2017		
OU-1A (IRP-13S) Explanation of Significant Differences	Rev. Draft Final	11/3/2017		
OU-1B (IRP-3 and -12) Explanation of Significant Differences	Rev. Draft Final	11/3/2017		
Field Change Justification for PFAS Sampling for Groundwater Remedial Action at OU-3/IRP Site 1	Draft	11/17/2017		
OU-1A/1B Addendum to OMP (New Contractor)	Draft	11/17/2017		
OU-3 Addendum to OMP (New Contractor)	Draft	11/17/2017		
OU-4B LCS Addendum to LUC RD/LTM/OMP (New Contractor)	Draft	12/1/2017		
OU-4B MCS Addendum to RD/RAWP (New Contractor)	Draft	12/1/2017		
Finding of Suitability to Transfer #10 for Carve-Outs 5 and 6	Draft	1/5/2018		

UPCOMING – FINAL

Neighborhood D-South Site Assessment and Soil Removal Action Report	Final	12/1/2017		
Remedial Design/Remedial Action Vapor Intrusion Assessment Report for Carve-Outs 5 and 6	Final	12/18/2017		

FIELDWORK

OU-1A & OU-1B O&M/LTM Annual Groundwater Monitoring Event (Expedited)	October or November 2017
Additional PFAS Sampling for Groundwater Remedial Action at OU-3/IRP Site 1	November or December 2017
Destruction of Monitoring Well MPMW06S (in Hangar 1)	December 2017
OU-4B MCS O&M/LTM	December 2017

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ID	Task Name	Start	Finish	Duration	1st Quarter			3rd Quarter
					Jan	Apr		
1		Tue 1/1/85	Mon 12/21/48	16685 days				
2	CERCLA Process	Tue 1/1/85	Mon 12/21/48	16685 days				
3	OU-1A (IRP-13S) and OU-1B (IRP-3 and -12)	Tue 1/1/08	Thu 7/27/28	5370 days				
4	Explanations of Significant Differences (Schedule based on finalization of the Vapor Intrusion Assessment)	Mon 9/30/13	Tue 12/19/17	1103 days				
5	Prepare Draft Explanations of Significant Differences	Mon 9/30/13	Mon 1/27/14	119 edays				
6	BCT Review Draft Explanations of Significant Differences	Mon 1/27/14	Fri 3/28/14	60 edays				
7	Prepare/Issue Draft Final Explanations of Significant Differences	Fri 3/28/14	Mon 5/12/14	45 edays				
8	BCT Review Draft Final Explanations of Significant Differences	Mon 5/12/14	Tue 5/27/14	15 edays				
9	Prepare/Issue Document Revisions (Revised Draft Final)	Thu 8/17/17	Wed 10/18/17	45 days				
10	BCT Review Document Revisions (Revised Draft Final)	Thu 10/19/17	Wed 11/1/17	10 days				
11	BCT Collaborate on Responses to Comments	Mon 11/6/17	Fri 11/17/17	10 days				
12	Issue Responses to Comments	Fri 11/17/17	Fri 11/17/17	0 days				
13	BCT Concur with Responses to Comments	Wed 11/22/17	Tue 12/5/17	10 days				
14	Issue Final Explanations of Significant Differences	Wed 12/6/17	Tue 12/19/17	10 days				
15	Land Use Control (LUC) Remedial Design (RD) Amendment (Schedule based on finalization of the Vapor Intrusion Assessment)	Mon 9/30/13	Tue 12/19/17	1103 days				
16	Prepare Draft LUC RD Amendment	Mon 9/30/13	Mon 1/27/14	119 edays				
17	BCT Review Draft LUC RD Amendment	Mon 1/27/14	Fri 3/28/14	60 edays				
18	Prepare/Issue Draft Final LUC RD Amendment	Fri 3/28/14	Mon 5/12/14	45 edays				
19	BCT Review Draft Final LUC RD Amendment	Mon 5/12/14	Tue 5/27/14	15 edays				
20	Prepare/Issue Document Revisions (Revised Draft Final)	Thu 8/17/17	Wed 10/18/17	45 days				
21	BCT Review Document Revisions (Revised draft Final)	Thu 10/19/17	Wed 11/1/17	10 days				
22	BCT Collaborate on Responses to Comments	Mon 11/6/17	Fri 11/17/17	10 days				
23	Issue Responses to Comments	Fri 11/17/17	Fri 11/17/17	0 days				
24	BCT Concur with Responses to Comments	Wed 11/22/17	Tue 12/5/17	10 days				
25	Issue Final LUC RD Amendment	Wed 12/6/17	Tue 12/19/17	10 days				
26	2013 Annual Performance Evaluation Report	Mon 11/11/13	Mon 10/6/14	235 days				
31	2014 Groundwater Monitoring Data Summary Report	Thu 9/18/14	Thu 9/18/14	0 days				
33	2014 Annual Performance Evaluation Report	Tue 11/11/14	Thu 10/15/15	242 days				
38	2015 Data Summary Report	Thu 10/8/15	Thu 10/8/15	0 days				
40	2015 Annual Performance Evaluation Report	Thu 12/31/15	Tue 11/22/16	234 days				
47	2016 Data Summary Report	Tue 9/13/16	Tue 9/13/16	0 days				
49	2016 Annual Performance Evaluation Report	Mon 1/2/17	Thu 9/7/17	179 days				
50	Prepare Draft Performance Evaluation Report	Mon 1/30/17	Fri 6/2/17	123.38 edays				
51	BCT Review Draft Performance Evaluation Report	Mon 6/5/17	Fri 8/4/17	60 edays				
52	Incorporate Comments/Issue Final Performance Evaluation Report (Replacement Pages)	Mon 8/7/17	Wed 9/6/17	30 edays				
53	Final Performance Evaluation Report	Fri 9/8/17	Fri 9/8/17	0 edays				
54	2017 Data Summary Report	Fri 10/6/17	Fri 10/6/17	0 days				
55	Issue 2017 Semiannual Groundwater Monitoring Data Summary	Fri 10/6/17	Fri 10/6/17	0 edays				
56	2017 Annual Performance Evaluation Report	Mon 1/1/18	Thu 7/19/18	144 days				
57	Prepare Draft Performance Evaluation Report	Mon 1/1/18	Fri 4/20/18	109.38 edays				
58	BCT Review Draft Performance Evaluation Report	Fri 4/20/18	Tue 6/19/18	60 edays				
59	Incorporate Comments/Issue Final Performance Evaluation Report (Replacement Pages)	Tue 6/19/18	Thu 7/19/18	30 edays				

NOTES: * NOT an SMP required deliverable.

ID	Task Name	Start	Finish	Duration	1st Quarter		3rd Quarter
					Jan	Apr	
60	Final Performance Evaluation Report	Thu 7/19/18	Thu 7/19/18	0 edays			
61	2018 Data Summary Report	Thu 9/20/18	Thu 9/20/18	0 days			
62	Issue 2018 Semiannual Data Summary	Thu 9/20/18	Thu 9/20/18	0 edays			
63	2018 Annual Performance Evaluation Report	Mon 12/31/18	Thu 7/18/19	144 days			
64	Prepare Draft Performance Evaluation Report	Mon 12/31/18	Fri 4/19/19	109.38 edays			
65	BCT Review Draft Performance Evaluation Report	Fri 4/19/19	Tue 6/18/19	60 edays			
66	Incorporate Comments/Issue Final Performance Evaluation Report (Replacement Pages)	Tue 6/18/19	Thu 7/18/19	30 edays			
67	Final Performance Evaluation Report	Thu 7/18/19	Thu 7/18/19	0 edays			
68	2019 Data Summary Report	Fri 9/20/19	Fri 9/20/19	0 days			
69	Issue 2019 Semiannual Data Summary	Fri 9/20/19	Fri 9/20/19	0 edays			
70	2019 Annual Performance Evaluation Report	Tue 12/31/19	Fri 7/17/20	144 days			
71	Prepare Draft Performance Evaluation Report	Tue 12/31/19	Fri 4/17/20	108.38 edays			
72	BCT Review Draft Performance Evaluation Report	Fri 4/17/20	Thu 6/18/20	62 edays			
73	Incorporate Comments/Issue Final Performance Evaluation Report (Replacement Pages)	Thu 6/18/20	Fri 7/17/20	29 edays			
74	Final Performance Evaluation Report	Fri 7/17/20	Fri 7/17/20	0 edays			
75	Long Term Monitoring/Operation and Maintenance (Note: Timeframe is estimated.)	Tue 1/1/08	Thu 7/27/28	5370 days			
76	OU-3 (IRP-1)	Fri 12/21/01	Mon 12/21/48	12261 days			
77	Implement OU-3 OMP with 5-year Reviews	Fri 12/21/01	Mon 12/21/48	12261 days			
82	Groundwater Monitoring Reports - OU-3	Mon 1/6/14	Thu 7/16/20	1706 days			
83	2013 Annual Long-Term Monitoring Report	Mon 1/6/14	Mon 6/23/14	121 days			
87	2014 Annual Long-Term Monitoring Report	Mon 1/5/15	Fri 5/22/15	99 days			
91	2015 Annual Long-Term Monitoring Report	Thu 12/31/15	Thu 1/26/17	282 days			
98	2016 Annual Long-Term Monitoring Report	Mon 1/2/17	Thu 7/20/17	144 days			
99	Prepare Draft Annual Long-Term Monitoring Report	Mon 1/2/17	Mon 4/24/17	112.38 edays			
100	BCT Review Draft Annual Long-Term Monitoring Report	Mon 4/24/17	Mon 6/26/17	63 edays			
101	Incorporate Comments/Resolve RTCs/Prepare Annual Long-Term Monitoring Report (Replacement Pages)	Mon 6/26/17	Wed 6/28/17	2 edays			
102	Final Annual Long-Term Monitoring Report	Wed 6/28/17	Wed 6/28/17	0 edays			
103	2017 Annual Long-Term Monitoring Report	Mon 1/1/18	Thu 7/19/18	144 days			
104	Prepare Draft Annual Long-Term Monitoring Report	Mon 1/1/18	Fri 4/20/18	109.38 edays			
105	BCT Review Draft Annual Long-Term Monitoring Report	Fri 4/20/18	Tue 6/19/18	60 edays			
106	Incorporate Comments/Resolve RTCs Prepare Annual Long-Term Monitoring Report (Replacement Pages)	Tue 6/19/18	Thu 7/19/18	30 edays			
107	Final Annual Long-Term Monitoring Report	Thu 7/19/18	Thu 7/19/18	0 edays			
108	2018 Annual Long-Term Monitoring Report	Mon 12/31/18	Fri 7/19/19	145 days			
109	Prepare Draft Annual Long-Term Monitoring Report	Mon 12/31/18	Fri 4/19/19	109.38 edays			
110	BCT Review Draft Annual Long-Term Monitoring Report	Fri 4/19/19	Tue 6/18/19	60 edays			
111	Incorporate Comments/Prepare RTCs and Annual Long-Term Monitoring Report (Replacement Pages)	Tue 6/18/19	Thu 7/18/19	30 edays			
112	Final Annual Long-Term Monitoring Report	Fri 7/19/19	Fri 7/19/19	0 edays			
113	2019 Annual Long-Term Monitoring Report	Tue 12/31/19	Thu 7/16/20	143 days			
114	Prepare Draft Annual Long-Term Monitoring Report	Tue 12/31/19	Fri 4/17/20	108.38 edays			
115	BCT Review Draft Annual Long-Term Monitoring Report	Fri 4/17/20	Tue 6/16/20	60 edays			
116	Incorporate Comments/Prepare RTCs and Annual Long-Term Monitoring Report (Replacement Pages)	Tue 6/16/20	Thu 7/16/20	30 edays			
117	Final Annual Long-Term Monitoring Report	Thu 7/16/20	Thu 7/16/20	0 edays			
118	OU-4B (IRP-5S[a], -6, -11, -13W, & MPA)	Tue 1/1/85	Wed 10/13/38	14027 days			

NOTES: * NOT an SMP required deliverable.

ID	Task Name	Start	Finish	Duration	1st Quarter		3rd Quarter
					Jan	Apr	
119	OU-4B Remedial Design/Remedial Action (RD/RA) Work Plan: IRP-5S(a), -6, & MPA (Moderate Concentration Sites): Subsequent monitoring reports will be based on the Final RD/RA Work Plan & Long Term OMP.	Tue 4/5/11	Thu 9/26/13	648 days			
131	Remedial Action Implementation/Fieldwork: IRP-5S(a), -6, & MPA (Moderate Concentration Sites)	Wed 10/16/13	Tue 2/18/14	90 days			
132	Interim Progress Monitoring Reports: IRP-5S(a), -6, and MPA (Moderate Concentration Sites)	Mon 6/24/13	Fri 2/28/14	180 days			
138	Annual Performance Evaluation Report (Events 1-4): IRP-5S(a), -6, and MPA (Moderate Concentration Sites)	Fri 3/28/14	Wed 1/7/15	204 days			
144	Annual Performance Evaluation Report - March 2014 - February 2015 (Moderate Concentration Sites)	Mon 7/27/15	Fri 6/3/16	225 days			
149	OU-4B Operation and Maintenance Plan (OMP): IRP-5S(a), -6, & MPA (Moderate Concentration Sites): Monitoring reports will be based on Final OMP.	Tue 7/22/14	Wed 9/16/15	301 days			
159	2015 Data Summary Report (Moderate Concentration Sites)	Mon 11/9/15	Mon 11/9/15	0 days			
161	2015 Annual Performance Evaluation Report (Moderate Concentration Sites)	Mon 11/30/15	Mon 11/21/16	256 days			
166	2016 Data Summary Report (Moderate Concentration Sites)	Fri 9/30/16	Fri 9/30/16	0 days			
168	2016 Annual Performance Evaluation Report (Moderate Concentration Sites)	Sun 10/30/16	Fri 7/28/17	196 days			
169	Prepare Draft Performance Evaluation Report	Sun 10/30/16	Wed 5/3/17	185 edays			
170	BCT Review Draft Performance Evaluation Report	Wed 5/3/17	Thu 6/22/17	50.38 edays			
171	Incorporate Comments/Issue Final Performance Evaluation Report RTCs and/ or Replacement Pages	Thu 6/22/17	Fri 7/28/17	36 edays			
172	Final Performance Evaluation Report	Fri 7/28/17	Fri 7/28/17	0 edays			
173	2017 Data Summary Report (Moderate Concentration Sites)	Wed 10/4/17	Wed 10/4/17	0 days			
174	Issue 2017 Semiannual Groundwater Monitoring Data Summary	Wed 10/4/17	Wed 10/4/17	0 edays			
175	2017 Annual Performance Evaluation Report (Moderate Concentration Sites)	Mon 11/27/17	Tue 10/16/18	232 days			
176	Prepare Draft Performance Evaluation Report	Mon 11/27/17	Thu 5/31/18	185 edays			
177	BCT Review Draft Performance Evaluation Report	Thu 5/31/18	Tue 7/31/18	61 edays			
178	Incorporate Comments/Issue Final Performance Evaluation Report RTCs and/ or Replacement Pages	Tue 7/31/18	Wed 10/3/18	64 edays			
179	Final Performance Evaluation Report	Wed 10/3/18	Tue 10/16/18	13 edays			
180	2018 Data Summary Report (Moderate Concentration Sites)	Fri 10/5/18	Fri 10/5/18	0 days			
181	Issue 2018 Semiannual Groundwater Monitoring Data Summary	Fri 10/5/18	Fri 10/5/18	0 edays			
182	2018 Annual Performance Evaluation Report (Moderate Concentration Sites)	Tue 11/27/18	Tue 10/15/19	230 days			
183	Prepare Draft Performance Evaluation Report	Tue 11/27/18	Fri 5/31/19	185 edays			
184	BCT Review Draft Performance Evaluation Report	Fri 5/31/19	Wed 7/31/19	61 edays			
185	Incorporate Comments/Issue Final Performance Evaluation Report RTCs and/ or Replacement Pages	Wed 7/31/19	Thu 10/3/19	64 edays			
186	Final Performance Evaluation Report	Thu 10/3/19	Tue 10/15/19	12 edays			
187	2019 Data Summary Report (Moderate Concentration Sites)	Fri 10/4/19	Fri 10/4/19	0 days			
188	Issue 2019 Semiannual Groundwater Monitoring Data Summary	Fri 10/4/19	Fri 10/4/19	0 edays			
189	2019 Annual Performance Evaluation Report (Moderate Concentration Sites)	Mon 11/25/19	Tue 10/13/20	231 days			
190	Prepare Draft Performance Evaluation Report	Mon 11/25/19	Fri 5/29/20	186 edays			
191	BCT Review Draft Performance Evaluation Report	Fri 5/29/20	Wed 7/29/20	61 edays			
192	Incorporate Comments/Issue Final Performance Evaluation Report RTCs and/ or Replacement Pages	Wed 7/29/20	Thu 10/1/20	64 edays			
193	Final Performance Evaluation Report	Thu 10/1/20	Tue 10/13/20	12 edays			
194	OU-4B Land Use Control RD: IRP-5S(a), -6, & MPA (Moderate Concentration Sites)	Tue 1/1/85	Tue 6/30/15	7949 days			
202	OU-4B Interim Remedial Action Completion Report (I-RACR): IRP-5S(a), -6, & MPA (Moderate Concentration Sites)	Tue 1/1/85	Tue 6/17/14	7679 days			
207	OU-4B Operating Properly and Successfully (OPS): IRP-5S(a), -6, & MPA (Moderate Concentration Sites)*	Wed 8/19/15	Mon 2/22/16	134 days			
213	OU-4B OPS: IRP-11 & -13W (Low Concentration Sites)*	Tue 2/12/13	Tue 2/3/15	516 days			
217	OU-4B 2013 Annual IC Compliance Monitoring Report: IRP-11 & -13W (Low Concentration Sites)	Mon 9/30/13	Tue 8/26/14	237 days			
222	OU-4B 2014 Annual IC Compliance Monitoring Report: IRP-11 & -13W (Low Concentration Sites)	Tue 9/30/14	Tue 8/18/15	230 days			

NOTES: * NOT an SMP required deliverable.

ID	Task Name	Start	Finish	Duration	1st Quarter		3rd Quarter
					Jan	Apr	
227	OU-4B 2015 Annual IC Compliance Monitoring Report: IRP-11 & -13W (Low Concentration Sites)	Tue 9/29/15	Tue 6/14/16	186 days			
232	OU-4B 2016 Annual IC Compliance Monitoring Report: IRP-11 & -13W (Low Concentration Sites)	Wed 11/2/16	Fri 4/21/17	124 days			
233	Prepare Draft Annual IC Compliance Monitoring Report	Wed 11/2/16	Fri 2/10/17	100.38 edays			
234	BCT Review Draft Annual IC Compliance Monitoring Report	Fri 2/10/17	Fri 4/14/17	63.38 edays			
235	Incorporate Comments/Issue Annual IC Compliance Monitoring Report RTCs and/or Replacement Pages	Fri 4/14/17	Fri 4/21/17	6 days			
236	Issue Final Annual IC Compliance Monitoring Report	Fri 4/21/17	Fri 4/21/17	0 edays			
237	OU-4B 2017 Annual LTM (IC Compliance) Report: IRP-11 & -13W (Low Concentration Sites)	Tue 10/3/17	Fri 8/17/18	230 days			
238	Prepare Draft Annual IC Compliance Monitoring Report	Tue 10/3/17	Wed 5/2/18	211 edays			
239	BCT Review Draft Annual IC Compliance Monitoring Report	Wed 5/2/18	Mon 6/4/18	33 edays			
240	Incorporate Comments/Issue Annual IC Compliance Monitoring Report RTCs and/or Replacement Pages	Mon 6/4/18	Fri 8/10/18	50 days			
241	Issue Final Annual IC Compliance Monitoring Report	Fri 8/10/18	Fri 8/17/18	7 edays			
242	OU-4B 2018 Annual LTM (IC Compliance) Report: IRP-11 & -13W (Low Concentration Sites)	Wed 10/3/18	Mon 9/16/19	248 days			
243	Prepare Draft Annual IC Compliance Monitoring Report	Wed 10/3/18	Thu 5/2/19	211 edays			
244	BCT Review Draft Annual IC Compliance Monitoring Report	Thu 5/2/19	Tue 6/4/19	33 edays			
245	Incorporate Comments/Issue Annual IC Compliance Monitoring Report RTCs and/or Replacement Pages	Tue 6/4/19	Tue 9/3/19	66 days			
246	Issue Final Annual IC Compliance Monitoring Report	Wed 9/4/19	Mon 9/16/19	12 edays			
247	OU-4B 2019 Annual LTM (IC Compliance) Report: IRP-11 & -13W (Low Concentration Sites)	Thu 10/3/19	Mon 9/14/20	248 days			
248	Prepare Draft Annual IC Compliance Monitoring Report	Thu 10/3/19	Fri 5/1/20	211 edays			
249	BCT Review Draft Annual IC Compliance Monitoring Report	Fri 5/1/20	Wed 6/3/20	33 edays			
250	Incorporate Comments/Issue Annual IC Compliance Monitoring Report RTCs and/or Replacement Pages	Wed 6/3/20	Wed 9/2/20	66 days			
251	Issue Final Annual IC Compliance Monitoring Report	Wed 9/2/20	Mon 9/14/20	12 edays			
252	OU-4B Long Term Monitoring (Note: Timeframe is estimated.)	Mon 6/3/13	Wed 10/13/38	6620 days			
253	Low Concentration Site	Mon 6/3/13	Wed 10/13/38	9263.38 edays			
254	Moderate Concentration Site	Mon 6/3/13	Fri 9/22/34	5562 days			
255	Other Documents	Fri 6/14/13	Fri 10/29/21	2188 days			
256	Neighborhood E	Fri 6/14/13	Fri 3/31/17	992 days			
270	Third Five-Year Review (Basewide) Due Before October 31, 2016*	Mon 1/4/16	Mon 10/31/16	215 days			
275	Fourth Five-Year Review (Basewide) Due Before October 31, 2021*	Mon 1/4/21	Fri 10/29/21	215 days			

NOTES: * NOT an SMP required deliverable.